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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,784	01/27/2004	Victor Dias	LLP109US	2477

29393 7590 12/27/2004

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EXAMINER

WILLIAMS, HOWARD L.

ART UNIT PAPER NUMBER

2819

DATE MAILED: 12/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary****Application No.**

10/765,784

**Applicant(s)**

DIAS ET AL.

**Examiner**

Howard L. Williams

**Art Unit**

2819

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2-012704 & 052704.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. A suggested title is:  
Pipelined ADC Using Mixed Architecture Stages.

The examiner acknowledges receipt of a information disclosure statement on 27 January 2004 and 27 May 2004. Initialed copies of the citation form should accompany this office action.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 9-13, 15-19 and 21 are rejected under 35 U.S.C. 102(b) as anticipated by Steensgaard-Madsen (US 6,271,782 B1). Steensgaard-Madsen discloses (figure 6) a pipeline implementation of algorithmic stages (coarse and middle quantizer stages) and a sigma-delta modulator as the last quantization stage of the pipeline (loop quantizer). Since the last quantization stage uses a sigma-delta architecture (quantizer, feedback, loop filter) it inherently provides noise shaping. Although Steensgaard-Madsen discloses four and five bit quantization and a third order loop filter in figure 6, Steensgaard-Madsen teaches in column 23 lines 17-20 that the quantizers may be of any resolution and the loop filter of any order. The "digital block" of claim 11 is seen to read upon the depicted delay elements and summers shown along the right-hand side of figure 6. Regarding the claimed "shift of its input signal" gain scaling is discussed at the top of column 8.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the


invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8, 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steensgaard-Madsen (US 6,271,782 B1) in view of Yu (US 6,348,888 B1) or Brooks et al. (US 5,982,313 A). Steensgaard-Madsen does not plainly show interstage pipeline gain elements that would provide the  $2Q_{N-1}$  input signal to the sigma-delta modulator stage. However, both Yu and Brooks et al. show in pipelined ADCs the well-known interstage gain provided in pipeline converters (Yu figure 1, 48 or Brooks fig. 1 Amp 1, Amp 2) to scale the interstage signal back to the reference level. It would have been obvious to combine either Yu or Brooks et al. with Steensgaard-Madsen to teach the interstage gain elements because it permits the use of the same reference voltage. Yu also discloses the routine noise shaping term of the sigma-delta loop,  $1 - z^{-1}$ , for first order implementations (last line col. 4).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Xu et al article and Gulati et al (US 6,686,860 B2) disclose programmable pipeline ADCs. and Andre et al (US 6,507,305 B2) discloses a mixed architecture ADC.

Any inquiry concerning this communication should be directed to Howard L. Williams at telephone number 571.272.1815. The Patent and Trademark Office has a new central facsimile number for application specific correspondence intended for entry, it is 703-872-9306.

12/22/04  
Voice 571.272.1815

  
Howard L. Williams  
Primary Examiner  
Art Unit 2819